Yiming Che

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PROFESSIONAL SKILLS & KNOWLEDGE

- **Programming Languages:** Python, Matlab, R
- **Skills:** Linux, Slurm, Git/GitHub, MySQL, PySpark, Pandas, Bash, PyTorch/TensorFlow, SKlearn, Hugging Face
- **Research Interests:** Generative models, Medical imaging, Bayesian statistics, Active learning

EDUCATION BACKGROUND

- **Binghamton University, State University of New York, NY, United States**
  Department of Systems Science and Industrial Engineering
  Doctor of Philosophy in Systems Science   May 2023

- **Binghamton University, State University of New York, NY, United States**
  Department of Systems Science and Industrial Engineering
  Master of Science in Industrial Engineering   May 2018

- **Capital University of Economics and Business, Beijing, China**
  Department of Industrial Engineering
  Bachelor of Science in Industrial Engineering   July 2017

PROFESSIONAL EXPERIENCE

- **Researcher at ASU-Mayo Center for Innovative Imaging**
  July. 2023 - Present, Tempe, AZ

  - **Multi-modality Models**
    - Finetuned BioMedCLIP model for headache diagnosis using patient's MRI and clinical notes. Achieved state-of-the-art performance in headache diagnosis with 0.96 AUC.

  - **Generative Models on Medical Imaging**
    - Modified Cycle-GAN for unpaired harmonizing FBP and PiB tracer in amyloid PET images. Achieved correlation coefficient 0.97.
    - Developing diffusion models with asynchronous schedule for robust lesion segmentation.

- **Postdoctoral Scholar at Arizona State University** (Advised by Dr. Teresa Wu)
  July. 2023 - Present, Tempe, AZ

  - **Generative Models on Medical Imaging**
    - Developed a fully weakly-supervised anomaly detection/segmentation framework (AnoFPDM) using guided diffusion models. Achieved state-of-the-art performance on lesion segmentation with DICE score 77.4 on BraTS21 dataset, eliminating pixel-level labels for hyperparameter tuning, which significantly reduces the annotation cost.
    - Developed a high-resolution PET image synthesis strategy using latent diffusion models. Achieved correlation 0.94 between synthesized PET image and digital phantoms.
    - Exploring the potential of using vision autoregressive models in medical images

- **Research Assistant at Binghamton University** (Advised by Dr. Changqing Cheng)
  Aug. 2017 - May 2023, Binghamton, NY

  - **Physics-informed Neural Network (PINN) for Covid-19 Outbreak Prediction**
    - Included Bayesian framework in traditional PINN for robust prediction. Achieved significant variance reduction $\sim 30\%$.

  - **Surrogate Modeling and Active Learning/Sequential Design**
    - Developed a novel surrogate model which combines generalized polynomial chaos and stochastic kriging model for efficient surrogate modeling of stochastic systems. Achieved $\sim 90\%$ improvement in computational budget without loss of accuracy compared to traditional Monte Carlo simulation.
    - Developed single-section and batch-selection sampling algorithms with Gaussian process. Achieved 70% improvement in computational efficiency compared to traditional one-shot design.

  - **Uncertainty Quantification for Machining Process**
    - Developed uncertainty quantification framework using generalized polynomial chaos expansion for machining process.

AWARD & HONOR

- 2023 Distinguished Dissertation Award, Binghamton University **(top 1%)**   2024
- Excellence in Systems Science Research Award, Binghamton University   2023
- INFORMS Bonder Foundation Award   2021
- Finalist, IISE-DAIS Mobile App Competition at 2021 IISE Annual Conference and Expo   2021
- Binghamton University Graduate Student Excellence Award in Research **(top 1%)**   2021
- Travel Grant of Midwest Dynamical Systems Conference 2019, University of Illinois at Chicago   2019
- Second Place, Best Student Paper Competition at 2019 IISE Annual Conference and Expo (Healthcare track)   2019
- Honorable Mention, Binghamton University Research Day Poster Competition, 2018   2018
- National Scholarship, Capital University of Economics and Business   2015

PUBLICATIONS   GOOGLE SCHOLAR PROFILE

1. Shah, J., **Che, Y.**, Sohankar, J., Luo, J., Li, B., Su, Y. and Wu, T. "Enhancing PET quantification: MRI-guided super-resolution using latent diffusion models" *Life* 14.12 (2024): 1580. https://doi.org/10.3390/life14121580

2. Shah, J., Krell-Roeschc, J., Forzanie, E., Knopmanf, D.S., Cliff, R.J., Petersenc, R.C., **Che, Y.**, Wu, T. and Geda, Y.E. "Predicting cognitive decline from neuropsychiatric symptoms and Alzheimer's disease biomarkers: A machine learning approach to a population-based data" *Journal of Alzheimer's Disease* 13872877241306654 (2025). https://journals.sagepub.com/doi/full/10.1177/13872877241306654

3. **Che, Y.**, Rafsani, F., Shah, J., Siddiquee, M. M. R. and Wu, T. "AnoFPDM: Anomaly segmentation with forward process of diffusion models for brain MRI" https://arxiv.org/abs/2404.15683 (Accepted by ASTAD workshop at WACV 2025).

4. Wan, J., Kataoka, J., Sivakumar, J., Pena, E., **Che, Y.**, Sayama, H. and Cheng, C. "Sparse Bayesian learning for sequential inference of network connectivity from Small Data" *IEEE Transactions on Network Science and Engineering* 11.6 (2024): 5892-5902. https://doi.org/10.1109/TNSE.2024.3471852

5. **Che, Y.**, Muller, J. and Cheng, C. "Dispersion-enhanced sequential batch sampling for contour estimation," *Quality and Reliability Engineering International* 40 (2024): 131–144. https://doi.org/10.1002/qre.3245

6. **Che, Y.** and Cheng, C. "Physical-statistical learning towards resilience assessment for power generating systems," *Physica A: Statistical Mechanics and its Applications* 615 (2023): 128584. https://doi.org/10.1016/j.physa.2023.128584

7. Ma, Q., **Che, Y.**, Cheng, C. and Wang, Z. "Characterizations and optimization for resilient manufacturing systems with considerations of process uncertainties," *Journal of Computing and Information Science in Engineering* 23.1 (2023): 1-30. https://doi.org/10.1115/1.4055425

8. Wan, J., **Che, Y.**, Wang, Z. and Cheng, C. "Uncertainty quantification and optimal robust design for machining operations," *Journal of Computing and Information Science in Engineering* 23.1 (2023): 0110005. https://doi.org/10.1115/1.4055039

9. **Che, Y.** and Cheng, C. "Active learning and relevance vector machine in efficient estimate for basin stability of dynamic networks," *Chaos: An Interdisciplinary Journal of Nonlinear Science* 31.5 (2021): 053129. https://doi.org/10.1063/5.0044899.

10. **Che, Y.**, Guo, Z. and Cheng, C. "Generalized polynomial chaos-informed efficient stochastic Kriging," *Journal of Computational Physics* 445 (2021): 110598. https://doi.org/10.1016/j.jcp.2021.110598.

11. Wu, X., Zheng, Y., **Che, Y.** and Cheng, C. "Pattern recognition and automatic identification of early-stage atrial fibrillation," *Expert Systems with Applications* 158 (2020): 113560. https://doi.org/10.1016/j.eswa.2020.113560.

12. **Che, Y.**, Cheng, C., Liu, Z. and Zhang, Z. "Fast basin stability estimation for dynamic systems under large perturbations with sequential support vector machine," *Physica D: Nonlinear Phenomena* 405 (2020): 132381. https://doi.org/10.1016/j.physd.2020.132381.

13. **Che, Y.**, Liu, J. and Cheng, C. "Multi-fidelity modeling in sequential design for identification of stability region in dynamic time-delay systems," *Chaos: An Interdisciplinary Journal of Nonlinear Science* 29.9 (2019): 093-105. https://doi.org/10.1063/1.5097934.

14. **Che, Y.** and Cheng, C. "Uncertainty quantification in stability analysis of chaotic systems with discrete delays," *Chaos, Solitons & Fractals* 116 (2018): 208-214. https://doi.org/10.1016/j.chaos.2018.08.024.